Space Weather Forecast

Issued on Saturday, 22 June 2024 at 01:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Moderate flares (R1-R2 radio blackouts) expected. Chance of isolated Strong flares (R3 radio blackouts). Chance of S1/Minor radiation storms.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with the peak flare a mid-Common class level event at 21/2350 UTC from a region beyond the southeastern limb. There are currently seven sunspot regions on the disc. The largest and most magnetically complex regions are located in the western hemisphere. The most sizeable of these lies in the southwest, with numerous large and mature spots, although it has become more magnetically simple during the period. The next largest region, also in the southwest retains a complex magnetic configuration with slight growth observed. A moderately complex and large region in the northwest decayed slightly with simplification of its magnetic structure. Two regions in the southeast presented as rather simple, moderately sized groups with little change. New simple, mature regions rotated over the eastern horizon during the period, meanwhile a small region near north-centre disc decayed from view.

A large lift-off of the sun's material (filament) from the northwest disc late on 21 Jun is likely to have resulted in a slow Coronal Mass Ejection (CME). Further imagery is required to determine if there is any Earth-directed component from this.

Solar Wind / Geomagnetic Activity: Solar winds indicated declining fast wind influence from a coronal hole, with speeds reducing from 450km/s (slightly elevated) to around 350km/s (slow) at the end of the period. Interplanetary Magnetic Field was weak, with the north-south component also varying weakly. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has remained at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Further Moderate flares are expected, with a chance of isolated Strong flares, most likely from the two large sunspot regions in the southwest disc.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast period, but with lower confidence than usual early in the period. A large lift-off of the sun's material (filament) from the northwest disc late on 21 Jun is awaiting further imagery to determine if there is any Earth-directed component. Slow solar winds are expected to persist through much of, if not the entire forecast period. There is a chance of a fast wind enhancement from the large coronal hole in the northwest disc on Days 1 and 2 (22 and 23 Jun), however, significant connection to this feature is considered unlikely given its high-latitude location on the disc. Another minor coronal hole enhancement is possible, but unlikely on Days 3 and 4 (24 and 25 Jun).

Overall mainly Quiet to Unsettled geomagnetic activity is expected. There is a chance of isolated

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Active intervals, mainly on Days 1 and 2 (22 and 23 Jun), should there be any notable connection to the aforementioned large coronal hole.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background levels, but with a chance of exceeding the S1/Minor Storm threshold should any notable flares occur, predominantly from any of the three large spots in the western hemisphere.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	80	80	80	80
Very Active	R3 to R5 X	No	25	25	25	25

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	30	30	30	30
Very Active	≥ S3 *	No	5	5	5	5

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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